

Math 1060 – Exam 4 Review (Chapter 5)

Solve the triangle with the given parts.

1. $\alpha = 28^\circ$, $\beta = 46^\circ$, $c = 17$

Solve the triangle. If there is more than one triangle with the given parts, give both solutions.

2. $\alpha = 41.2^\circ$, $a = 8.1$, $b = 10.6$

3. $\beta = 75.3^\circ$, $b = 12.4$, $c = 9.8$

4. $\gamma = 37.9^\circ$, $a = 15.3$, $c = 6.1$

Solve the problem.

5. To find the distance \overline{AB} across a river, a distance $\overline{BC} = 923$ m is laid off on one side of the river. It is found that $\beta = 113.4^\circ$ and $\gamma = 12.5^\circ$. Find \overline{AB} .

Solve the triangle with the given parts.

6. $\gamma = 84.9^\circ$, $a = 7.28$, $b = 8.51$

7. $a = 6.2$, $b = 12.5$, $c = 13.8$

Solve the problem.

8. To find the distance between two small towns, an electronic distance measuring (EDM) instrument is placed on a hill from which both towns are visible. If the distance from the EDM to the towns is 3.6 miles and 5.7 miles and the angle between the two lines of sight is 53° , what is the distance between the towns? Round your answer to the nearest tenth of a mile.

Find the area of triangle ABC .

9. $\alpha = 15.0^\circ$, $b = 10.7$, $c = 7.3$

Find the area of the triangle using Heron's formula. Round to the nearest unit.

10. $a = 73.5$, $b = 86.4$, $c = 34.9$

Find the magnitudes of the horizontal and vertical components for the vector with the given magnitude and direction angle. Round to an appropriate number of significant digits.

11. $|\mathbf{v}| = 38.6$, $\theta = 77.5^\circ$

Find the component form of the vector with the given magnitude and direction angle.

12. $|\mathbf{v}| = 20.6$, $\theta = 102.5^\circ$

Find the magnitude and direction angle (to the nearest tenth) of the vector. Give the measure of the direction angle as an angle in $[0^\circ, 360^\circ)$.

13. $\langle 8, -8\sqrt{3} \rangle$

Perform the indicated operation. Use the form $\langle a, b \rangle$ for vectors. $\mathbf{u} = \langle -1, 5 \rangle$, $\mathbf{v} = \langle 4, -7 \rangle$

14. Find $3\mathbf{u} - \mathbf{v}$

15. Find $\mathbf{u} \cdot \mathbf{v}$

Find the smallest positive angle between the given vectors to the nearest tenth of a degree.

16. $\langle -1, 5 \rangle$ and $\langle 2, 7 \rangle$

Determine whether the vectors are parallel, perpendicular, or neither.

17. $\langle 2, -4 \rangle$ and $\langle 6, 3 \rangle$

18. $\langle 9, 1 \rangle$ and $\langle 1, 9 \rangle$

19. $\langle -1, 7 \rangle$ and $\langle 3, -21 \rangle$

Solve the problems.

20. One rope pulls a barge due east with a force of 75 N, and another rope pulls the barge due south with a force of 87 N. Find the magnitude of the resultant force acting on the barge.
21. A force of 689 lb is required to pull a boat up a ramp inclined at 16.0° to the horizontal. How much does the boat weigh?
22. An airplane flies on a compass heading of 90.0° at 375 mph. The wind affecting the plane is blowing from 295° at 43 mph. What is the true course and ground speed of the airplane? Round results to an appropriate number of significant digits.